

CLAIMS

WHAT IS CLAIMED IS:

1. An article cleaning apparatus comprising:
an air management mechanism;
a cleaning basket assembly;
a fluid regeneration device;
a working fluid device coupled to said fluid regeneration device, said cleaning basket assembly, and said air management mechanism;
a clean fluid device coupled to said cleaning basket assembly and said fluid regeneration device;
a controller coupled to said air management mechanism, said cleaning basket assembly, said working fluid device, said regeneration device, and said clean fluid device; wherein said controller is configured to control a cleaning process, including at least a solvent cleaning process, wherein said solvent cleaning process utilizes a solvent based cleaning fluid comprising cyclic siloxane solvent; and
a solvent contaminant detection device coupled to the fluid regeneration device to determine an amount of solvent contaminant that may accumulate in the solvent.
2. The article cleaning apparatus of claim 1 wherein said solvent contaminant detection device comprises an electromagnetic source and detector responsive to contaminant absorbance of electromagnetic radiation.
3. The article cleaning apparatus of claim 2 wherein said electromagnetic device consists of a source and detector selected from the group consisting of an ultraviolet source and ultraviolet detector, and an infrared source and infrared detector.

4. The article cleaning apparatus of claim 2 wherein said electromagnetic device comprises an ultraviolet device including an ultraviolet source, a flow-through cell for passing samples of siloxane solvent from the fluid regeneration device, and a detector responsive to ultraviolet radiation radiated from the ultraviolet source through the flow-through cell.

5. The article cleaning apparatus of claim 4 wherein said ultraviolet device further comprises a filter configured to pass frequencies in a bandpass responsive to the presence of at least one contaminant likely to accumulate in the solvent.

6. The article cleaning apparatus of claim 4 wherein said contaminant comprises a family of contaminants.

7. The article cleaning apparatus of claim 1 wherein said solvent contaminant detection device is coupled to the controller to generate a signal when a concentration of contaminants present in the solvent reaches a predefined limit.

8. The article cleaning apparatus of claim 7 wherein said predefined limit is chosen to indicate degradation in a regeneration adsorption media in said fluid regeneration device.

9. The article cleaning apparatus of claim 1 further comprising a turbidity sensor in combination with the solvent contaminant detection device, wherein said turbidity sensor is configured to detect the presence of particulates in the solvent, and said solvent contaminant detection device is configured to detect the presence of dissolved contaminants in the solvent.

10. A solvent contaminant detection device configured to detect the presence of dissolved contaminants in a solvent used for performing a solvent dry cleaning process, wherein said solvent cleaning process utilizes a solvent based cleaning fluid comprising cyclic siloxane solvent.

11. The solvent contaminant detection device of claim 10 comprising an electromagnetic device responsive to contaminant absorbance of electromagnetic radiation.

12. The solvent contaminant detection device of claim 11 wherein said electromagnetic device consists of a detector selected from the group consisting of an ultraviolet detector and an infrared detector.

13. The solvent contaminant detection device of claim 11 wherein said electromagnetic device comprises an ultraviolet detector including an ultraviolet source, a flow-through cell for passing samples of siloxane solvent from a fluid regeneration device, and a detector responsive to ultraviolet radiation radiated from the ultraviolet source through the flow-through cell.

14. The solvent contaminant detection device of claim 13 wherein said ultraviolet device further comprises a filter configured to pass frequencies in a bandpass responsive to the presence of contaminants likely to accumulate in the solvent.

15. The solvent contaminant detection device of claim 14 wherein said solvent contaminant detection device is coupled to a controller configured to generate a signal when a concentration of contaminants present in the solvent reaches a predefined limit.

16. The solvent contaminant detection device of claim 15 wherein said predefined limit is chosen to indicate degradation in a regeneration adsorption media in said fluid regeneration device.

17. The solvent contaminant detection device of claim 10 in combination with a turbidity sensor, wherein said turbidity sensor is configured to detect the presence of particulates in the solvent, and said solvent contaminant detection device is configured to detect the presence of dissolved contaminants in the solvent.

18. An article cleaning apparatus comprising:

a controller configured to control a cleaning process, including at least a solvent cleaning process, wherein said solvent cleaning process utilizes a solvent based cleaning fluid comprising cyclic siloxane solvent; and

a solvent contaminant detection device configured to detect the presence of dissolved contaminants in the solvent, the detector coupled to the controller to generate a signal indicative of when to replace a regeneration adsorption media used for purifying the cleaning fluid.